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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/817,511 | 04/02/2004 | John Bugel | VTE-152-B | 3160 |

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WILLIAM M HANLON, JR
YOUNG & BASILE, PC
3001 WEST BIG BEAVER ROAD
SUITE 624
TROY, MI 48084-3107

| EXAMINER | |
|---|---|
| LOPEZ, FRANK D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3745 | |

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/817,511 | BUGEL ET AL. | |
| | Examiner | Art Unit | |
| | F. Daniel Lopez | 3745 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *March 13, 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☐ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

### *Response to Amendment*

Applicant's arguments filed March 13, 2006, have been fully considered but they are not deemed to be persuasive.

Applicant's arguments with respect to claims 1-28 have been considered but are deemed to be moot in view of the new grounds of rejection. The new grounds of rejection are necessitated by the added limitations that the valve is a piezoelectric valve.

Applicant states that each occurrence of the term "multi-valve" before "manifold" has been deleted. This is incorrect. In the copy of the claims submitted to the Office, the term "multi-valve" still occurs. If applicant wants to claim the valves as part of the manifold, they can't be claimed as being attached to the manifold and only a single valve (i.e. at least one) can't be claimed.

Applicant agrees that a control program is a set of commands interpreted and executed by another device, but argues that the limitation "a control program operably connected to" is understood to mean that the connection is not necessarily a direct connection and that another device may be required to make the connection. Applicant is mistaken. The other device is an element necessary to interpret and execute the set of commands, and therefore is a necessary element of the claims. If controller is too broad, applicant is welcome to use a broader term.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 112*

Claims 1-28 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Throughout the claims (e.g. claim 1 line 4 -manifold-- should replace "multi-valve manifold", since the manifold is attached to various elements including valves, but does not appear to have valves as part of the manifold. In some of the claims, the

multi-valve manifold is attached to one control valve (e.g. claim 1 line 6-7), which further confuses what a "multi-valve manifold" is.

In claim 1 line 17-18, and claim 19 line 16-17 "a control program operably connected to...valve...for controlling actuation" and claim 10 line 16-19 "controlling actuation of the at least two valves...with a control program operably connected to the at least two valves" are confusing, since a control program is a set of instructions. Suggest that -controller having a-- be added before "control program" of line 14. Dependent claims (e.g. claims 7 and 8) should be similarly modified.

Claims not specifically mentioned are indefinite, since they depend from one of the above claims.

***Claim Rejections - 35 USC § 103***

Claims 1, 3-5, 23 and 24 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Rector et al, Yeaple and Applicant's admitted prior art. Stephenson et al discloses an apparatus for controlling a position of a fluid cylinder (16, 36), having first and second expandable chambers (e.g. 18, 19), defined by a piston (e.g. 15), adjacent first and second ends, respectively, of the cylinder, comprising first and second pressure sensors (e.g. 29, 30, respectively) associated with the first and second chambers, respectively; first and second electrically actuated proportional flow solenoid valves (e.g. 21, 22, respectively) for selectively and proportionally controlling flow into and out of, respectively, of the first chamber; a controller having a control program operably connected to the valves and pressure sensors, to control the valves in response to pressures measured by the pressure sensor; but does not disclose that the valves are connected to a manifold having an inlet port an exhaust port and an outlet port; that there is at least on discrete position sensor for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor; or that the valves are piezoelectric valves controlled by either variable voltage or variable current.

Rector et al teaches, for an apparatus for controlling a position of a fluid cylinder (16), having first and second expandable chambers (17, 18), defined by a piston, adjacent first and second ends, respectively, of the cylinder, comprising electrically actuated flow valve (36) for controlling flow into and out of the first chamber; and a controller (73) having a control program operably connected to and controlling the valve; that there is at least on discrete position sensor (e.g. 74) for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, for the purpose of reducing the speed if the piston when it nears its end of stroke position (column 1 line 66- column 2 line 3).

Since Stephenson et al and Rector et al are both from the same field of endeavor, the teachings disclosed by Rector et al would have been recognized in the pertinent art of Stephenson et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to include at least on discrete position sensor for sensing a discrete predetermined position of the piston of Stephenson et al, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, as taught by Rector et al, for the purpose of reducing the speed if the piston when it nears its end of stroke position.

Yeaple teaches, for a set of valves, that the valves can be connected to a manifold (including several different types) having associated porting, for the purpose of enhancing performance and decreasing leakage (page 73 paragraph entitled Modular Valving, each type of manifold connected valving has their own specific advantage over the others).

Since Stephenson et al has a plurality of valves and Yeaple teaches standard ways to combine a plurality of valves together; it would have been obvious at the time the invention was made to one having ordinary skill in the art to connect the valves of Stephenson et al to a manifold having associated porting, as taught by Yeaple, for the purpose of enhancing performance and decreasing leakage.

Applicant's admitted prior art teaches, for an electrically actuated proportional flow valve, that it is well known to make the valve as a piezoelectric valve controlled by either variable voltage or variable current (page 11 line 1-14)

Since the proportional valves of Stephenson et al and Applicant's admitted prior art are equivalent in the fluid actuator control art; it would have been obvious at the time the invention was made to one having ordinary skill in the art to replace the electrically actuated proportional flow solenoid valves of Stephenson et al with electrically actuated proportional flow piezoelectric valves controlled by either variable voltage or variable current, as taught by Applicant's admitted prior art, as a matter of engineering expediency.

Claims 1-8, 10-17 and 19-28 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Morita et al, Rector et al, Yeaple and Applicant's admitted prior art. Stephenson et al discloses an apparatus for controlling a position of a hydraulic type fluid cylinder (16, 36), having first and second expandable chambers (e.g. 18, 19), defined by a piston (e.g. 15), adjacent first and second ends, respectively, of the cylinder, and method, comprising first and second pressure sensors (e.g. 29, 30, respectively) associated with the first and second chambers, respectively; first, second, third and fourth electrically actuated proportional flow solenoid valves (e.g. 21, 22, 23, 24, respectively) for selectively and proportionally controlling flow into and out of, respectively, of the first and second chambers, respectively; a controller having a control program operably connected to the valves and pressure sensors, to control the valves in response to pressures measured by the pressure sensor; but does not disclose that the valves are connected to a manifold having an inlet port an exhaust port and an outlet port; that there is first, second and third position sensors located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors; that the controller initializes a home position when the piston is sensed by the first position

sensor, and calculates a required pressure to move the piston a desired distance from the midpoint position; or that the valves are piezoelectric valves controlled by either variable voltage or variable current.

Morita et al teaches, for an apparatus for controlling a position of a air type fluid cylinder (34), having first and second expandable chambers (34a, 34b), defined by a piston (36), adjacent first and second ends, respectively, of the cylinder, and method, comprising electrically actuated flow valve (30) for controlling flow into and out of the first chamber; and a controller (90) having a control program operably connected to and controlling the valve; that there is first, second and third position sensors (e.g. 38, 42, 44, respectively) located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors, that the controller initializes a home position when the piston is sensed by the first position sensor (by steps s6 and s7 of fig 5), and calculates a required pressure to move the piston a desired distance from the midpoint position (e.g. steps s8-s13, fig 5 and 6), for the purpose of stopping the piston at its end of stroke position in a shock free state, without requiring any position adjustment of the position sensors (column 1 line 54-58).

Rector et al teaches, for an apparatus for controlling a position of a hydraulic type fluid cylinder (16), having first and second expandable chambers (17, 18), defined by a piston, adjacent first and second ends, respectively, of the cylinder, and method, comprising electrically actuated flow valve (36) for controlling flow into and out of the first chamber; and a controller (73) having a control program operably connected to and controlling the valve; that there is at least on discrete position sensor (e.g. 74) for sensing a discrete predetermined position of the piston, wherein the position sensor is connected to the controller, such that the valve is controlled in response to the position measured by the position sensor, for the purpose of reducing the speed of the piston when it nears its end of stroke position (column 1 line 66- column 2 line 3), to limit shocks when stopped at its end position (e.g. column 1 line 15-21).

Since Stephenson et al discloses a hydraulic type cylinder, since Rector et al teaches a need for limiting shocks when a piston of a hydraulic type cylinder approaches an end position, and since Morita et al teaches a method of limiting shocks when a piston of a fluid cylinder approaches an end position; one having ordinary skill in the art would recognize that the purpose disclosed by Morita et al would have been recognized in the pertinent art of Stephenson et al, due to the teachings of Rector et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to include first, second and third position sensors located adjacent a midpoint of the operating stroke and adjacent an end and an opposite end of the travel of the piston of Stephenson et al, respectively, for sensing discrete predetermined positions of the piston, wherein the position sensors are connected to the controller, such that the valve is controlled in response to the positions measured by the position sensors, with the controller initializing a home position when the piston is sensed by the first position sensor, and calculates a required pressure to move the piston a desired distance from the midpoint position, as taught by Morita et al, for the purpose of stopping the piston at its end of stroke position in a shock free state, without requiring any position adjustment of the position sensors.

Yeaple teaches, for a set of valves, that the valves can be connected to a manifold (including several different types) having associated porting, for the purpose of enhancing performance and decreasing leakage (page 73 paragraph entitled Modular Valving, each type of manifold connected valving has their own specific advantage over the others).

Since Stephenson et al has a plurality of valves and Yeaple teaches standard ways to combine a plurality of valves together; it would have been obvious at the time the invention was made to one having ordinary skill in the art to connect the valves of Stephenson et al to a manifold having associated porting, as taught by Yeaple, for the purpose of enhancing performance and decreasing leakage.

Applicant's admitted prior art teaches, for an electrically actuated proportional flow valve, that it is well known to make the valve as a piezoelectric valve controlled by either variable voltage or variable current (page 11 line 1-14)

Since the proportional valves of Stephenson et al and Applicant's admitted prior art are equivalent in the fluid actuator control art; it would have been obvious at the time the invention was made to one having ordinary skill in the art to replace the electrically actuated proportional flow solenoid valves of Stephenson et al with electrically actuated proportional flow piezoelectric valves controlled by either variable voltage or variable current, as taught by Applicant's admitted prior art, as a matter of engineering expediency.

Claim 9 and claims 9 and 18 are rejected under 35 U.S.C. § 103 as being unpatentable over Stephenson et al in view of Rector et al, Yeaple and Applicant's admitted prior art, as applied to claim 1 above, and over Stephenson et al in view of Morita et al. Rector et al and Yeaple, as applied to claim 1 and 10, respectively, above, respectively, and further in view of Neilson et al. The modified Stephenson et al discloses all of the elements of claim 9, or claims 9 and 18, respectively; but does not disclose that there is means for biasing the piston toward the midpoint position.

Neilson et al teaches, for an apparatus for controlling a position of a hydraulic type fluid cylinder (12), having first and second expandable chambers, defined by a piston (14), adjacent first and second ends (20, 26), respectively, of the cylinder, and method, comprising a flow valve (72) for controlling flow into and out of the first chamber; that there is means for biasing (30) the piston toward the midpoint position.

Since the cylinders of Stephenson et al and Neilson et al are functionally equivalent in the piston art, it would have been obvious at the time the invention was made to one having ordinary skill in the art to add a means for biasing the piston of Stephenson et al toward the midpoint position, as taught by Neilson et al, as a matter of engineering expediency.

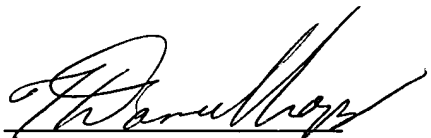
***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571-272-4821. The examiner can normally be reached on Monday-Thursday from 6:15 AM -3:45 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is 571-273-8300. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.



F. Daniel Lopez
Primary Examiner
Art Unit 3745
May 23, 2006